Importance-Performance Analysis As A Tool In Evaluating Higher Education Service Quality: The Empirical Results Of Estig (IPB)

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Abstract

Effective management depends on the ability to assess the quality of services provided. The models of quality management are applied in business and has been adapted for use in the education sector, based on the experiences lived by the students.

Based on the literature review and empirical study, following the Importance-Performance Analysis, this study identifies the strengths and weaknesses of the School of Technology and Management of Bragança, from the perspectives and perceptions of students who attend the school. According to the results obtained it was concluded that students were satisfied with the performance and quality of services provided by the institution.

Keywords: Importance-Performance Analysis; Higher Education; Students Perceptions; Bragança Polytechnic Institute.

1. Introduction

Quality has become an important subject of discussion among Higher Education Institutions, and has been extensively studied in recent years. One of the main ways to retain students is determining if they are satisfied with the institution performance as they compare to what they expected when their arrival at the institution, and during the frequency at academic years.

Importance-Performance Analysis (IPA) are a part of marketing research techniques that involve the analysis of customer attitudes toward main product or service and has been applied in several markets: *e.g.,* automotive, food, housing, education, health care, hospitality industry, tourism, among others (*e.g.,* Sethna, 1982; Hawes & Rao, 1985; Cunningham & Gaeth, 1989; Dolinsky, 1991; Martilla & James, 1977; Alexitch *et al*. 2004; Kitcharoen, 2004; Go & Zhang, 2008; Silva & Fernandes, 2010).

The study investigated the importance and performance of service attributes in School of Technology and Management (ESTiG), of Polytechnic Institute of Bragança (Portugal), as perceived by undergraduate and master students. The study also required to determine the relationship between the perceived service quality and student satisfaction. For that the IPA model is a methodological used.

This paper is organized as follow: section 2, reviews importance-performance analysis; section 3, presents the importance and performance of attributes perceived by students, the methodology applied and the respective results; and finally, the more meaningful findings of the study are described in section 4.

2. Importance-Performance Analysis

Importance-Performance Analysis was first proposed and introduced by Martilla and James (1977) as a means by which to measure client satisfaction with a product or service. The IPA approach recognizes satisfaction as the function of two components: the importance of a product or service to a client and the performance of a business in providing that service or product (Martilla & James, 1977). In this way, IPA examines not only the performance of an item, but also the importance of that item as a determining factor in satisfaction to the respondent (Silva & Fernandes, 2010). The combined client ratings for those two components then provide an overall view of satisfaction with clear directives for management and where to focus agency resources.

This method has proven to be a generally applicable tool which is relatively easy to administer and interpret resulting in extensive use among researchers and managers in various fields, and is a way to promote the development of effective marketing programs, because it facilitates the interpretation of data and increases usefulness in making strategic decisions (Slack, 1994; Matzler *et al*., 2003; Kitcharoen, 2004; Abalo *et al*., 2007; Silva & Fernandes, 2010).

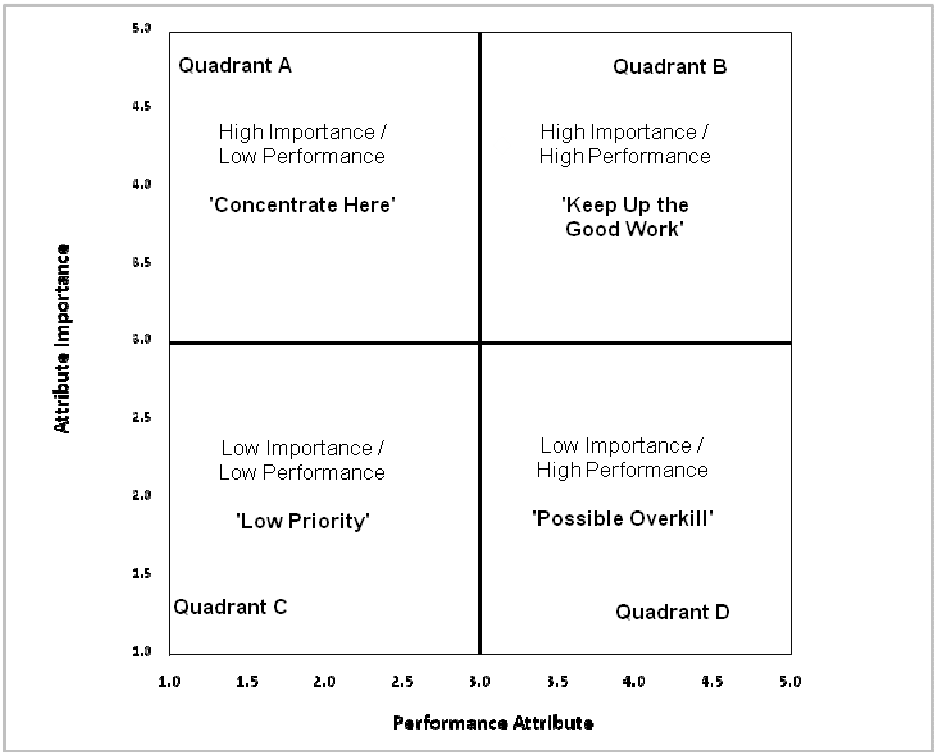

Fig. 1. Importance-Performance Matrix (Adapted from Martilla & James, 1977, p. 78).

The IPA consists of a pair of coordinate axis where the 'importance' (y-axis) and the 'performance' (x-axis) of the different elements involved in the service are compared (see Fig. 1). Each of the quadrants combines the importance and the performance assigned by the customers/user given element of the service and possesses a different value in terms of management and the respective mean of self-stated raw importance and attribute performance data is the original point of this IPA matrix (Martilla & James, 1977; Guadagnolo, 1985; Bacon, 2003; Matzler *et al*., 2003; Zhang & Chow, 2004; Pike, 2004; Go & Zhang, 2008; Silva & Fernandes, 2010). Each quadrant suggests a different marketing strategy.

The four quadrants in importance-performance analysis are characterized as (Martilla & James, 1977, p. 78):

> "- A. Concentrate here - high importance, low performance: requires immediate attention for improvement and are major weaknesses;
>
> - B. Keep up with the good work - high importance, high performance: indicate opportunities for achieving or maintaining competitive advantage and are major strengths;
>
> - C. Low priority - low importance, low performance: are minor weaknesses and do not require additional effort;
>
> - D. Possible overkill - low importance, high performance: indicate that business resources committed to these attributes would be overkill and should be deployed elsewhere".

3. Perceived Importance and Performance of Attributes: Methodology and Results

We used the IPA for assessing students' perceptions of the School of Technology and Management of Polytechnic Institute of Bragança, located in Bragança town, Portugal. The methodology of the empirical research was articulated in three main steps: (i) selection of variables to be included in the Importance-Performance analysis according with the survey research; (ii) definition and execution of the survey; (iii) data-analysis and presentation of results.

3.1. Selection of Variables

As for the selection of the determinants of students' satisfaction, the choice has been made on the basis of previous literature (*e.g.*, Joseph & Joseph, 1997; Alves, 1998; Pike, 2004); as result we decided to focus on the following attributes:

(i) Quality of General Aspects: it includes Moderns facilities, Clean facilities, Sports activities, Cultural activities, Associations of students;

(ii) Quality of the Library: Easy access to shelves; Ways of consulted rapidly; Warmth of its staff and Interest in solving the problems of student;

(iii) Quality of Computer Laboratory Facilities: Availability of laboratories and computer facilities; Ability to use after classes and Existence of training in computer tools;

(iv) Quality of Social Services: Financial aid for students; Existence of medical support to students; Availability of accommodation for students; Existence of canteens; Knowledge of rules and procedures; Trust and safety in service; Information service completion; Interest in solving the problems of student; Simple rules and procedures and Warmth of its staff;

(v) Quality of Academic Services: Simple procedures; Knowledge of rules and procedures Simple procedures; Interest in solving the problems of student; Trust and safety in service; Information service completion; Quick response and Warmth of its staff;

(vi) Quality of Teaching Aspects: Friendliness of the teachers; Personalized attention; Easy communication with teachers; Clarity and precision in the exposure of knowledge; Scientific expertise of the teacher; Fair assessment and Advice the basic bibliography;

(vii) Quality of Undergraduate Programmes: Updated content and Several career opportunities;

(viii) Quality of External Relations: Getting the internships; Exchange programs with foreign; Conferences and seminars and Internet connection.

3.2. Sample and Questionnaire

The survey was conducted during April and May of 2010, in 2nd semester of the 2009/2010 academic year. A total of 695 valid questionnaires were received, which represents 34% of total population (2.031 students). The sample size resulted in sampling error of 3,7%, assuming a 95% confidence level.

The instrument used was divided into two sections: section I collected the general demographic information of the student; while section II refers to students' perceptions of the importance and performance of key attributes and their satisfaction for these attributes. The attributes under consideration are: Quality of General Aspects, Quality of the Library, Quality of Computer Laboratory facilities, Quality of Academic Services, Quality of Teaching Aspects, Quality of Undergraduate Programmes, and Quality of External Relations.

The data for this study were collected in classroom, applying a questionnaire to the students who attend the undergraduate programmes and master degree programmes at the School of Technology and Management of Polytechnic Institute of Bragança (Portugal).

All the items were adapted from scales developed in similar studies (*e.g.*, Joseph & Joseph, 1997; Alves, 1998; Pike, 2004); besides to evaluate the single factors, students were also asked to provide an overall evaluation of the overall perceived satisfaction. All the evaluations were measured through a five-point Likert scale (1=Strongly disagree; 2=Disagree; 3=Neither agree or disagree; 4=Agree; 5=Strongly agree).

3.3. Findings and discussion

Table 1 lists some of the socio-demographic characteristics of the respondents. The original sample consisted in 695 students, 46% female and 54% male, and the majority has between 18 and 22 years old and coming from undergraduate programs, 57,8% from engineering sciences and 42,2% from management sciences. As to their origin, this sample is characterized by 87,9% of students come from the area north of Portugal, and the, district of Bragança, Braga and Porto the main contributors, with respectively 37,5%, 22,4 % and 20,1%. The Central Region represents 7,5% of the sample, and the districts of Aveiro and Viseu are the most representative with respectively 3,7% and 2,4%. The area referred to as Other is responsible for 4,6% of the sample, among which are students with 1,2% PALOP (African Countries of Portuguese Official Language).

Table 1: Socio-demographic characteristics of respondents [n=695].

Variable	No.	%
Gender		
Female	320	46,0
Male	375	54,0
Age		
18-22 years old	510	73,0
22-27 years old	133	19,0
> 28 years old	52	8,0
Study Areas		
Engineering Sciences	402	57,8
Management Sciences	293	42,2

Academic Year		
1st	262	38,0
2nd	226	32,0
3rd	145	21,0
1st master degree	62	9,0
Geographical location		
Northern	611	87,9
Central	52	7,5
Others	32	4,6

After the sample characterization is intended to make the analysis Importance-Performance applied to ESTiG, methodology already explained above. It is useful to check not only the importance that students attach to different attributes of the service, as well as the performance on the part of the institution, thus analyzing students' satisfaction or dissatisfaction. To this end, this study was based on analysis of eight categories/attributes and variables that are different in each category and are an integral part of the questionnaire.

According to the below table, the attributes that students mentioned as the most important being a higher education institution were: the general aspects, the fact that the facilities are modern and clean, the library's ability to allow easy access to books the shelves and quick reference, the availability of laboratories and computer facilities, financial support to students and the existence of the canteen. For faculty, the ease of communication with teachers, clarity and precision in the exposition of knowledge, the scientific capacity of teachers and assessing fair, the courses have updated content and professional opportunities, the final stages of obtaining and last connection to the Internet. And the other hand the attributes considered less important are related to general aspects of the institution and relate to sports, culture and the existence of associations of students.

In evaluating the quality of services provided by ESTiG, the variables that presented the best performance with the general aspects were (see Table 2): the fact that ESTiG have modern facilities, clean and the existence of students associations. The variables with the best performance in library services were the possibility of allowing easy access to shelves and books and quick reference, these were also the variables considered most important in this service. The Social Services have a better performance with the availability of accommodation in student residences and the existence of the canteen. For faculty related variables emerged the friendliness of the teachers, ease communication with teachers, the scientific expertise and advice of the basic bibliography, as those that showed the best performance. The two variables related to the undergraduate programmes had a good performance. In relation to the external relations only one of this variable category present a value below the average. Generally the aspects considered the most negative are related to the Academic Services, where none of the variables was higher than the global average.

The values obtained for the standard deviation (SD) are considered low; the variations of the responses are low, with some figures that showed significant discrepancies (Table 2). This measure reflects the variation of dispersion of a set of data around the mean, i.e., the greater or less variability of results. Therefore, regarding the performance, the variables that showed significant values of discrepancy were: sports, kindness and interest in solving the problems of students in library services, financial aid to students, and availability of medical support to students, there are rules and the simple things of Social Services, Academic Services in the quick service and obtain internships.

In order to approach the importance that students assign to different attributes of the service, as well as know the value of performance on the part of the institution, we calculated the mean and standard deviations for the aggregated data. The results are presented in Table 2, according to the mean. For all the important attributes had an approximate average score of 4 or higher, varying between 3,967 and 4,616. The four attributes considered most important were: undergraduate programmes (average 4,616), the quality teaching aspects (mean 4,450), the quality of external relations (average 4,408) and quality of the library (average of 4,372),

and those with values above the global average. The least important attribute was the quality of general aspects. In the other hand, the average of the attributes of performance varies between 3,798 and 3,143 being the average of responses between the 3 and 4, it can be said that the average values are satisfactory since they are always higher than the midpoint 3. These results suggest that in general, students are satisfied with the performance of ESTiG as the average of all aggregate variables are higher than the intermediate value. The attributes that were most performance, considering those who had an average higher than the global average, was five. The 1st place in the ranking included the undergraduate programmes, 2nd place the quality of external relations, 3rd place the quality of the general aspects, 4th place the quality teaching services and finally the quality of the library. The quality of Academic Services is the attribute that showed lower performance from the perspective of students.

Table 2: Importance-Performance Ratings for ESTiG.

Categories/Attributes/Variables	Importance		Performance	
	Mean[a]	SD	Mean[b]	SD
1. General Aspects	**3,967**	**0,817**	**3,600**	**0,845**
1.1 Moderns facilities	4,18	0,772	3,78	0,736
1.2 Clean facilities	4,55	0,655	3,88	0,730
1.3 Sports activities	3,55	0,900	2,94	1,052
1.4 Cultural activities	3,76	0,833	3,29	0,874
1.5 Associations of students	3,79	0,922	4,12	0,832
2. Library	**4,372**	**0,807**	**3,505**	**0,933**
2.1 Easy access to shelves	4,42	0,764	4,06	0,796
2.2 Ways of consulted rapidly	4,45	0,759	3,56	0,850
2.3 Warmth of its staff	4,25	0,875	3,14	1,077
2.4 Interest in solving the problems of student	4,37	0,829	3,25	1,007
3. Computer Laboratory Facilities	**4,315**	**0,781**	**3,452**	**0,892**
3.1 Availability of laboratories and computer facilities	4,44	0,754	3,66	0,858
3.2 Ability to use after classes	4,32	0,792	3,35	0,954
3.3 Existence of training in computer tools	4,19	0,797	3,35	0,865
4. Social Services	**4,294**	**0,809**	**3,454**	**0,955**
4.1 Financial aid for students	4,47	0,845	3,47	1,051
4.2 Existence of medical support to students	4,25	0,882	3,18	1,003
4.3 Availability of accommodation for students	4,29	0,856	3,69	0,958
4.4 Existence of canteens	4,51	0,716	4,21	0,865
4.5 Knowledge of rules and procedures	4,16	0,791	3,63	0,872
4.6 Trust and safety in service	4,26	0,780	3,46	0,901
4.7 Information service completion	4,13	0,813	3,34	0,961
4.8 Interest in solving the problems of student	4,35	0,786	3,28	0,960
4.9 Simple rules and procedures	4,27	0,765	3,14	1,008
4.10 Warmth of its staff	4,24	0,856	3,15	0,973
5. Academic Services	**4,267**	**0,825**	**3,143**	**0,939**
5.1 Simple procedures	4,23	0,817	3,19	0,906
5.2 Knowledge of rules and procedures	4,28	0,798	3,24	0,882
5.3 Interest in solving the problems of student	4,32	0,809	3,21	0,932
5.4 Trust and safety in service	4,27	0,808	3,19	0,920
5.5 Information service completion	4,19	0,840	3,13	0,920
5.6 Quick response	4,31	0,845	2,94	1,025
5.7 Warmth of its staff	4,27	0,861	3,08	0,989
6. Teaching Aspects	**4,450**	**0,749**	**3,518**	**0,903**
6.1 Friendliness of the teachers	4,32	0,789	3,52	0,869
6.2 Personalized attention	4,26	0,808	3,49	0,880
6.3 Easy communication with teachers	4,46	0,721	3,65	0,913
6.4 Clarity and precision in the exposure of	4,64	0,699	3,47	0,896

knowledge				
6.5 Scientific expertise of the teacher	4,57	0,720	3,56	0,899
6.6 Fair assessment	4,62	0,748	3,33	0,939
6.7 Advice the basic bibliography	4,28	0,755	3,61	0,923
7. Undergraduate Programmes	**4,616**	**0,691**	**3,798**	**0,873**
7.1 Updated content	4,57	0,713	3,72	0,891
7.2 Several career opportunities	4,66	0,670	3,87	0,855
8. External Relations	**4,408**	**0,783**	**3,681**	**0,928**
8.1 Getting the internships	4,56	0,794	3,21	1,113
8.2 Exchange programs with foreign	4,33	0,764	3,76	0,877
8.3 Conferences and seminars	4,22	0,828	3,59	0,896
8.4 Internet connection	4,53	0,747	4,16	0,827
Total Average	***4,336***	***0,783***	***3,519***	***0,908***

[a] Rating obtained from a five-point Likert scale ranging from "Very unimportant" (1) to "Very important" (5).
[b] Rating obtained from a five-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

Importance-Performance matrix is represented in Fig. 2. So, bearing in mind a study with the values of intermediate scales (Silva & Fernandes, 2010) is indispensable to do an analysis based on the overall median values, recommended by Lynch *et al*. (1996) and Martilla and James (1977). These authors suggest that should still be considered the median value of the data reported to cross the axes, based on the trend of responses, median values as a measure of central tendency are theoretically preferable to means because a true interval scale may not exist. Can thus be observed four different quadrants being the axis defined by the global median values (4,51; 3,54) for the attributes and the global average.

The results are spread over 3 quadrants (Fig. 2). In Quadrant B were aspects of the undergraduate programmes, these aspects are a paramount importance for students and high satisfaction, the ESTiG has a good performance, and should continue to work and continue to meet the needs of their students. Quadrant C covers the most services, the aspects related with Academic Services, Social Services, Computer Laboratory Facilities, Library and issues related to Teaching Aspects. Quadrant C called the Low Priority demonstrates that student performance is below average, but do not consider important, shows low importance and low satisfaction with these attributes so do not require additional efforts. In Quadrant D appeared aspects with External Relations and the General Aspects of the school. It thus appears that these aspects have a below average importance and satisfaction for the same students, is above average, indicating that these aspects should receive attention by the ESTiG, and may be used in its promotion. However there should be a balanced consideration not to be wasting excessive strain.

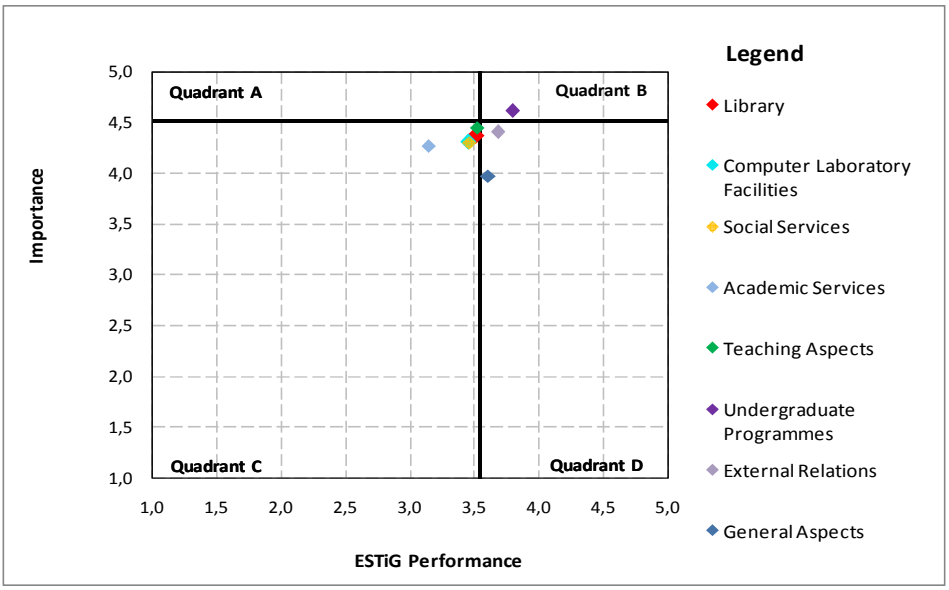

Fig. 2. IPA for the global average, according to the median value for the axis.

4. Conclusions

Importance-Performance Analysis (IPA) is simple and useful techniques that can help managers identify which attributes should be improved to increase overall customer satisfaction. From the research prospective, this study supports the adoption of the IPA as an alternative framework for evaluating students' satisfaction. Such framework can be used in further research on students' satisfaction.

Through the Importance-Performance Analysis we concluded that the attributes considered most important by students in Higher Education Institution were: the quality of undergraduate programmes, the quality aspects related to teaching, external relations and the quality of the Library.

The quality of the general aspects was considered the less important. In the other hand and regarding the ESTiG performance, in the students' point of view, the results showed that in general, students are satisfied with the performance of ESTiG since the average of all aggregate variables are higher than the intermediate value. The attributes considered by the students surveyed, with higher performance included: the quality of undergraduate programmes, the quality of external relations, the quality of general aspects, the quality of teaching aspects and ultimately the quality of the Library. The attribute with the lowest performance was the quality of Academic Services.

The generalization of these results should not, however, be overstated. It would be interesting to look at institution board management and employers' perceptions in terms of education quality attributes and how these differences affect the types of policy and management practice.

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